

distribution network stability at an acceptable level for this time period so that most of the main distribution network in terms of prioritised power loads can be maintained. Furthermore, by utilisation of such emergency generators fuel and running costs can be minimised whilst providing redundancy and sufficiency for continued seamless backup generation within the overall main distribution network.

[0036] By appropriate modes of operation it will be understood that aspects of the present invention provide a distributed power generation system and method of operating such a system which has greater potential for utilisation than conventional emergency generators. Such conventional emergency generators will depend upon load shedding algorithms which have less flexibility and will be susceptible to sudden transition to an island state. Aspects of the present pre-configure the main distribution network into virtual local group distribution networks, or virtual islands, such that transfer to practical islands is less abrupt and potentially seamless should a network fault actually occur. Clearly, aspects of the present invention depend upon consideration of a set of criteria as a pre-indicator of potential onset of a network fault. In such circumstances care must be taken with regard to the set of criteria and the divergence from that criteria as triggers for establishing virtual islands.

[0037] The size of virtual islands can vary. It will be appreciated for absolute protection a power source in the form of the transportable generator or emergency generator may be linked to one electrical power load as a local group distribution network and therefore a virtual island. In such circumstances with the onset of the divergence from the set of criteria for the main distribution network the electrical power source will be dedicated to that prioritised power load in preference to electrical power supply to the remainder of the main distribution network. Clearly, providing a one to one relationship between power sources and power loads will be impractical for a main distribution network wide consideration as local group distribution networks. Consequently local group distribution networks may comprise one or more power sources associated with one or more power loads prioritised appropriately. The controller will be arranged dependent upon the power load prioritisation as well as capacity in terms of power sources in defining acceptable local group distribution networks as virtual islands.

[0038] Clearly, establishing virtual islands as indicated provides hypothecation of electrical power sources with electrical power loads. Such hypothecation and dedication in a virtual island in presumptive normal operation for the main distribution network is contrary to the general objectives of such distributed power generation systems. As indicated above a principal objective of a main distribution network is to create flexibility in terms of the number of power sources which can provide electrical power to the main distribution network such that the cheapest or most reliable or cleanest sources can be used in preference to more expensive, less reliable and more variable sources. Hypothecation of electrical power sources to power loads will limit such flexibility by operating services which otherwise would not be used and advanced prioritising of electrical power loads in terms of providing sufficient electrical power to those power loads should a virtual island be created either unintentionally or deliberately. The virtual islands in terms of local group distribution networks of power sources and power loads in such circumstances can be considered configuration of the main distribution network as a re-configuration of the main distri-

bution network for expectation of problems rather than efficiency, cost or even reliability of delivery by the whole system.

[0039] Distributed power generation systems and methodology as described above can be utilised in a number of situations. Thus for example the electrical power sources may be used in marine systems or systems utilised in aviation.

[0040] Modifications and alterations to aspects of the present invention will be appreciated by persons skilled in the technology. Thus for example as described above levels of constriction to the virtual islands in terms of the closeness of matching or electrical power sources with electrical power demands within a local group distribution network can vary proportionately to the degree of divergence from the set of criteria. It will be understood that the closest to a virtual island created the greater reduction in flexibility with regard to objective distribution network operation. Consequently for small diversions from the set of criteria the controller and methodology will only restrict to the virtual island to a limited extent whilst large and sustained deviations from the set of criteria may pre-empt the distribution network more closely in terms of the prescribed virtual island in view of the more likely imminence of a practical island occurring due to such degradation in network performance.

1. A method of operating a distributed power generation system comprising a plurality of electrical power sources and a plurality of electrical loads, interconnected by a main distribution network, one or more switches for forming one or more local group distribution networks, each local distribution network comprising at least one electrical power source and at least one electrical load, the method comprising monitoring the main distribution network by comparing the electrical power flow with a set of criteria, determining if the electrical power flow on the main distribution network diverges from the set of criteria, maintaining the switch between at least one of the local group distribution networks and the main distribution network closed and configuring the at least one of the local group distribution networks whereby the electrical power from the or each electrical power source within the at least one of the local group distribution networks substantially matches the electrical power requirements of the electrical loads in the at least one of the local group distribution networks if the electrical power flow in the main distribution network diverges from the set of criteria.

2. A method as claimed in claim 1 comprising identifying priority electrical loads within the at least one of the local group distribution network and ensuring the priority electrical loads are preferentially incorporated within the local group distribution network in preference to lesser priority electrical loads.

3. A method as claimed in claim 1, comprising shedding electrical loads within the at least one of the local group distribution networks.

4. A method as claimed in claim 1 comprising controlling the power output of the electrical power sources within the at least one of the local group distribution networks.

5. A method as claimed in claim 1 comprising reducing power exchange between the at least one of the local group distribution networks and the main distribution network.

6. A method as claimed in claim 5 comprising reducing power exchange between the at least one of the local group distribution networks and the main distribution network to zero.